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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/756,875	01/13/2004	Loyal M. Johnson JR.	Phelps US-28	3420

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EXAMINER	
PAK, JOHN D	

ART UNIT	PAPER NUMBER
1616	

DATE MAILED: 12/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/756,875	JOHNSON ET AL.	
	Examiner	Art Unit	
	JOHN PAK	1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This Office action is in response to applicant's amendments and remarks filed on 10/7/2005.

Claims 1-55 are now pending in this application.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-55 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1-49 have been amended to require the silver component to be "uncombined elemental silver." New claims 50 to 53 are dependent on claims 1, 17, 34 and 39, respectively. New claims 54 requires the silver to be elemental silver that is not adhered to carrier particles. New claim 55 requires the silver to be elemental silver that is not adhered to ceramic particles. The Examiner has determined such amendatory subject matter as containing new matter, which does not adequate descriptive support from the originally filed disclosure.

The "uncombined" feature

Applicant's originally filed disclosure contains no disclosure as to "uncombined elemental silver." Mere absence of a feature is not basis for an exclusion. MPEP 2173.05(i). Further, the specification appears to suggest the exact opposite of "uncombined." In paragraphs 0017 and 0018, "silver particles contaminated with phenolic resin, resulting in silver particles with an appearance that is brown in color" is disclosed as being suitable. Whatever is meant by "uncombined," it is believed that phenolic resin that is so integrated with silver particles as to change its color from the silver metallic color to a brown color would be within the ambit of such a feature. Therefore, there is nothing in the originally filed disclosure that would have conveyed uncombined elemental silver to the skilled artisan.

The "not adhered to" features

Similar to above, applicant's originally filed disclosure contains no disclosure as to the "not adhered to" feature, to either carrier particles or ceramic particles. The phenolic resin disclosure shows adherence of silver particles thereto. Hence, there is an absence of disclosure as to the claimed features and presence of a contrary disclosure. Therefore, there is nothing in the originally filed disclosure that would have conveyed to the skilled artisan such an exclusionary feature with respect to the elemental silver.

For these reasons, the amendatory claim features as noted above fail to find adequate descriptive support from the originally filed disclosure.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 17-18, 20, 34, 39, 41, 48, 54-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Hiraoka et al. (JP 06-340501).

Hiraoka et al. explicitly disclose an antimicrobial wax that is made by mixing in a wax 0.5 to 30 wt% of an antimicrobial silver[1]. See the JPAB abstract; see also translation of claims 1-2 and paragraph 9 (process steps and percentages).

The cited prior art reference therefore expressly discloses every element of the claimed invention. Certain of the claim features are discussed below.

"Consisting essentially of"

The phrase "consisting essentially of" limits the scope of a claim to those that do not materially affect the basic and novel characteristics of the claimed invention. Here, the claimed invention is directed to an antimicrobial wax preparation. Applicant's

[1] The full document is being cited here. An English abstract, JPAB 406340501, and machine translation are provided herewith.

specification states that any synthetic waxes or wax analogs, including carnauba wax and even polyethylene and polypropylene, are suitable as the wax component (paragraph 0010). The wax component may also be in the form of "a variety of ready-made wax preparations," including those for floor care, furniture care and protection of other surfaces" (paragraph 0012). As for the silver component, silver particles that are adhered to phenolic resin are disclosed as being suitable (paragraphs 0017 and 0018). Therefore, the phrase "consisting essentially of" fails to exclude any ingredient that may be found in Hiraoka's antimicrobial wax preparation.

"Uncombined elemental silver" or "adhered to" carriers or ceramic particles

Hiraoka et al. disclose silver per se, so elemental silver is expressly disclosed. There is no disclosure in Hiraoka et al. that the silver must be adhered to a carrier or ceramic particle. Because Hiraoka's silver is not disclosed as being combined with anything, it meets the "uncombined" feature.

"Uncombined elemental silver are available to be ionized in an amount sufficient to kill bacteria"

In Hiraoka's antimicrobial wax, silver is present and uncombined. Said silver is thus "available" to be ionized as claimed.

"Bacteria are killed at a rate of about 99% within about 24 hours ...."

Hiraoka's 0.5 to 30 wt% silver would necessarily possess such a kill rate. MPEP 2112, 2112.01.

"Uncombined elemental silver is dispersed in said dispersion in an antimicrobially effective amount"

Hiraoka's wax base is described as an "emulsification" (paragraph 0009). The silver must be mixed so as to obtain "effective distribution" for antimicrobial effect (bottom third of paragraph 0009). Applicant's claim feature is thereby met.

For these reasons, the above noted claims are anticipated by Hiraoka et al.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Lowe (US 5,837,078) and Burrell et al. (US 5,837,275) in view of Hiraoka et al. and Grier.

Lowe teaches the incorporation of an antimicrobial agent to wax preparations. See from column 2, line 41 to column 3, line 38. 0.1 wt% antimicrobial agent is disclosed as a "conventional" amount in wax preparations (column 3, lines 35-36).

Burrell et al. disclose antimicrobial silver that has been processed to possess atomic disorder so that it provides sustained release of metal species such as metal ions (see from column 3, line 66 to column 4, line 38; column 6, lines 24-35; Example

10 on columns 18-19). The silver can be pure metal (column 4, line 29) in the form of particles, size les than 20 nm (column 7, lines 40-42; column 12, lines 34-35) or slightly larger size such as 30 nm (column 18, line 51). The antimicrobial property of the atomically disordered silver is taught to be applicable in a wide variety of substrates, including sterile packaging, clothing, footwear, laboratory equipment, tables, "enclosures and wall coverings, and the like" (column 9, lines 6-14).

Hiraoka et al. disclose an antimicrobial wax that is made by mixing in a wax 0.5 to 30 wt% of an antimicrobial silver[2]. See the JPAB abstract; see also translation of claims 1-2 and paragraph 9 (process steps and percentages).

The article by Grier is cited to establish the well known, broad-spectrum antimicrobial activity of silver and silver compounds (see pages 375-387). Treated filter elements reduce bacterial counts of water from 500,000 E. coli per ml to zero within a few hours and silver deposit effective concentration is 0.006 to 0.5 ppm (page 377, first paragraph under "Activity"). Elemental silver provides higher activity than silver compounds (page 378, right column, first paragraph). Table 18-2 discloses a 60 minute bacterial kill rate for a 0.1 wt/v% solution of silver nitrate that is higher than 99% (page 378).

[2] The full document is being cited here. An English abstract, JPAB 406340501, and machine translation are provided herewith.

The differences between the claimed invention and the cited references are as follows. At the outset, it is noted that the phrase "consisting essentially of" was already discussed previously in this Office action, and the discussion there is incorporated herein by reference.

Neither Lowe nor Burrell et al. explicitly disclose a surface preparation (or a process of making such a preparation) that contains a dispersion of wax and silver particles in an antimicrobially effective amount, wherein the silver is uncombined elemental silver. However, Lowe teaches incorporation of antimicrobial agents to wax preparations, i.e. wax dispersions, at conventional amounts such as 0.1 wt%. While Lowe does not specify that the antimicrobial agent is uncombined elemental silver, one having ordinary skill in the art would have had sufficient motivation to select silver to supply the antimicrobial functionality. Burrell et al. teach a form of silver, sized less than 20 nm or alternatively including 30 nm, which has enhanced antimicrobial activity. Burrell et al. teach such silver, which is uncombined, in elemental form, and available to be ionized to kill bacteria, to be useful for delivering antimicrobial activity to myriad substrates such as tables, enclosures and wall coverings. It is noted that such substrates are precisely the type of substrates that typically get treated with a wax preparation. One having ordinary skill in the art, already having been taught by Hiraoka et al. of the use of elemental silver in wax formulations and Grier of the excellent antimicrobial activity of uncombined elemental silver (available to be ionized), would

thus have been motivated to utilize Burrell's antimicrobially enhanced nano-sized silver particles as the antimicrobial agent in Lowe's formulation with the expectation that advantageous antimicrobial functionality would be obtained.

Numerous claims recite an "average spacing" feature. Neither Lowe nor Burrell et al. disclose any average spacing feature. However, the Examiner still finds that the feature and the claimed invention as a whole would have been obvious to the ordinary skilled artisan.

The ordinary skilled artisan is taught from the prior art that silver is an excellent antimicrobial and bactericide, especially Burrell's atomically disordered silver. Applicant's feature, average spacing, is no more than a function of the number of silver particles per given volume in a homogeneously mixed system. Hence, the various spacing permutations set forth in the claims such as (i) less than 1 μm, (ii) 0.5-3 μm, (iii) less than 3 μm, and (iv) greater than 0.5 μm are simply alternative ways of describing weight percentage of silver-containing particles per unit volume. It is the Examiner's position that given silver's well known antimicrobial activity against a myriad microbial pathogens, one having ordinary skill in the art would have been motivated to arrive at effective antimicrobial concentrations of silver that suits the target application situation. Given the broad range of silver concentration in wax taught by Lowe and Hiraoka et al. (0.1 wt%, 0.5-30 wt%) and silver sizes (Burrell et al.), the average spacing as claimed in

applicant's claims would have been obtained from the concomitant selection of those parameters in order to produce an effective silver-containing antimicrobial wax.

The Examiner's position is supported by applicant's examples. In all of applicant's examples, 30 nm average particle size and 0.005 to 0.246 wt% were used to achieve the invention examples (Examples 1-10, specification pages 6-11). Further, in paragraph [13] it is disclosed that 60 nm silver particles at 0.185 wt/v% provided 1 μm average spacing and 30 nm silver particles at 0.025 wt% provided 1 μm average spacing, as well as "about 5 nanometers to about 100 nanometers will also be effective in at least the weight percentages such as are disclosed herein."

Therefore, applicant's specification examples are evidence that the Examiner's reasoning given above is accurate: selection of prior art silver concentration and silver particle size from the motivation of antimicrobial efficacy would have naturally led to the instant average spacing feature, because such feature is no more than an alternative way of expressing the concentration of the silver particles in the wax.

With respect to the feature of claim 18, Grier is cited to establish that one having ordinary skill in the art would have been quite capable of obtaining about 99% kill rate within 24 hours by using silver (see above cited parts in Grier). Motivation to do so comes from the expected benefit of obtaining high rate of bacterial elimination within a day after application, particularly with Burrell's antimicrobially-enhanced silver particles.

Therefore, the claimed invention, as a whole, would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made, because every element of the invention and the claimed invention as a whole have been fairly disclosed or suggested by the teachings of the cited references.

For these reasons, all claims must be rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to JOHN PAK whose telephone number is **(571)272-0620.** The Examiner can normally be reached on Monday to Friday from 8 AM to 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's SPE, Gary Kunz, can be reached on **(571)272-0887**.

The fax phone number for the organization where this application or proceeding is assigned is **(571)273-8300**.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JOHN PAK
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